Abstract

Title of abstract: A study on effect of head pillow, shoulder roll and head rotation on Right IJV caliber in patients undergoing elective surgery under general anaesthesia.

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Background

Central venous catheter is required for managing patients posted for certain surgeries and a variety of clinical conditions. Right internal jugular vein is the most commonly used site by anaesthetists. Although ultrasound guidance has increased success rate and reduced complications of central venous cannulation, there are still complications associated with the procedure. We used ultrasound assessment of right internal jugular vein in our study to find the optimal position for right internal jugular vein cannulation.

Objectives

To assess changes in Right IJV diameter based on position using ultrasound, to determine optimal patient position in which IJV diameter is the largest. To assess the degree of overlap between Right IJV and Carotid based on position using ultrasound to find the optimal position in which the overlap is minimal

Methodology

Patients who satisfy inclusion criteria were recruited in the study and informed consent was taken. Patients were anaesthetized and placed in the following 3 positions, supine with i) P1 - no head pillow or shoulder roll, ii) P2 - with head pillow and iii) P 3 - with shoulder roll. All measurements were made in 15 degree Trendelenberg tilt and head turned to the left by 30 degree. The following measurements were recorded in all 3 positions.

- Transverse and anteroposterior diameter of the Right Internal jugular vein (IJV)
- Transverse diameter of the Right Carotid
- Overlap between Right IJV and Carotid

Results

In our study the mean transverse diameter of Right IJV was 18.7mm in P1 and P2 and 17.2 mm in P3. The mean anteroposterior diameter was 13.9 mm, 13.7mm and 11.3 mm in P1, P2 and P3 respectively. The increase in diameter in P1 was statistically significant ($p<0.0005$). The incidence of maximum diameter was highest in P1 (50%). The mean overlap percentage between Right Carotid and Right IJV was 49.41%, 50.97% and 35.7% in P1, P2 and P3 respectively. This difference between P3 and other two positions was also statistically significant ($p<0.0005$).

Conclusion

From our study, we suggest placing the patient supine in 15 degree Trendelenberg tilt with no head pillow or shoulder roll, with 30 degree head rotation to the opposite side will lead to greater chance of first pass success during right IJV cannulation as the diameter of IJV is largest in this position. We also found that overlap between Right IJV and Carotid was least when a shoulder roll was used.

Keywords: Right internal jugular vein, Right Carotid artery, Right IJV and Carotid overlap, Ultrasound, Head pillow, Shoulder roll, Trendelenberg ,Central venous cannulation.